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ABSTRACT

The U.S. Consumer Product Safety Commission estimates that from January 1, 1974 through December 31, 1974, approximately 118,000 persons received hospital emergency room treatment nationwide for injuries related to playground equipment. Of this estimate, approximately 45,000 injuries occurred on public playground equipment and approximately 41,000 on home playground equipment. Over three-fourths of the reported injuries involved children under 10 years of age. Lacerations, contusions/abrasions, and fractures accounted for 86 percent of the injuries. Nearly half of the injuries occurred to the head, and the injuries to the extremities comprised 41 percent of the total. More than two-thirds of the injuries occurring on home playground equipment involved swing sets. Climbing apparatus, slides, swings, and swing sets were each involved in from 25 to 35 percent of the injuries related to public playground equipment. Indepth studies of 83 public and 62 home playground-related injuries conducted since February 1973 indicated that the primary hazard pattern involved falls from the equipment. Other frequent patterns included instances in which the victim was struck with a moving piece of equipment; or an extremity was entrapped at a pivot or pinch point. Twenty-four death certificates showed that falls, hanging, and being struck by a moving part of the equipment were the most frequent causes of playground equipment deaths. (Author/RC)

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ED120102

HAZARD ANALYSIS

PLAYGROUND EQUIPMENT

APRIL 1975

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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U.S. CONSUMER PRODUCT SAFETY COMMISSION
Bureau of Epidemiology
Washington, D.C. 20207

HAZARD ANALYSIS

OF

INJURIES RELATING TO PLAYGROUND EQUIPMENT

Swings/Swing Sets	(1241)
Slides	(1242)
Seesaws	(1243)
Playground Climbing Apparatus	(1244)

March 1975

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ABSTRACT

The U.S. Consumer Product Safety Commission estimates that from January 1, 1974 through December 31, 1974, approximately 118,000 persons received hospital emergency room treatment nationwide for injuries related to playground equipment. Of this estimate approximately 45,000 injuries occurred on public playground equipment and approximately 41,000 on home playground equipment. On the Consumer Product Hazard Index for July 1, 1972 through June 30, 1973, playground equipment ranked eighth. Between January 1, 1974 and December 31, 1974, 4,769 injuries associated with playground equipment were reported through the National Electronic Injury Surveillance System (NEISS). Of this total 1,772 occurred on public playground equipment and 1,595 on home playground equipment.

Over three-fourths of the reported injuries involved children under 10 years of age. Lacerations, contusions/abrasions, and fractures accounted for 86 percent of the injuries. Nearly half of the injuries occurred to the head, and the extremities comprised 41 percent of the total. Injury victims were treated and released most of the time; only 5 percent were hospitalized. More than two-thirds of the injuries occurring on home playground equipment involved swing sets. Climbing apparatus, slides, swings and swing sets were each involved in from 25 to 35 percent of the injuries related to public playground equipment.

There were in-depth studies of 83 public and 62 home playground-related injuries conducted since February 1973. These indicated the primary hazard pattern as involving falls from the equipment. Other frequent patterns

included instances in which the victim was struck with a moving piece of equipment; or an extremity was entrapped at a pivot or pinch point.

Twenty-four death certificates showed that falls, hanging, and being struck by a moving part of the equipment were the most frequent causes of playground equipment deaths.

I. INTRODUCTION

The outdoor playground equipment industry is divided into two major groups: (1) Institutional and commercial playground (to be referred to in this analysis as public playground equipment) and (2) home playground equipment. Public playground equipment intended for recreational sites and school playgrounds is more heavily constructed than equipment intended for backyard use.

Seventy-one companies manufacture public playground equipment and 57 companies manufacture home playground equipment. Only one of the above firms manufactures both classes of playground equipment. Two companies hold over 50 percent of the non-school segment of the public playground equipment market while 12 firms supply the major share of the school segment market. Five companies are reported to account for more than 50 percent of manufacturers sales of home playground equipment.[1]

The current public playground equipment market is estimated to be about $60 million. The non-school segment of the market is approximately $40 million while the school segment is around $20 million. The non-school is anticipated to have a higher annual growth rate than the school segment--10 to 15 percent versus 5 percent. The home playground equipment market is estimated to be between $50 and $75 million per year at the retail level and expected to remain stable.[2]

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[1] Earl T. Yeager, Industry Profile on Public and Home Playground Equipment (Contract No. CPSC-C-74-195, July 1974), pp. 1-9.

[2] Ibid.

Public playground equipment is usually sold directly by the manufacturer or his agent to the purchaser. Home playground equipment is usually sold to the purchaser through retail stores such as department stores, discount stores, and hardware stores. The producer of home playground equipment sells direct or by representative to the retail stores' purchasing channel or independent warehouse distributors.[3]

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[3]Ibid.

II. PROBLEM

The U.S. Consumer Product Safety Commission estimates that in Calendar Year 1974, 118,000 injuries associated with playground equipment were treated in U.S. hospital emergency rooms. Of this total 41,000 were associated with home playground equipment; 45,000 were associated with public playground equipment; 32,000 were associated with playground equipment for which the location or type could not be specified. The Methodology section explains the indicators used to categorize the products involved.

The most frequent hazard associated with playground equipment is falls, particularly from slides and climbing apparatus. Three-fourths of all the injuries were falls to the ground or onto other equipment. Other hazards were: 1) being struck by a piece of moving equipment, 2) rough edges, 3) protruding bolts, and 4) entrapment of extremities in equipment. Two incidents of strangulation from ponchos caught on an angular upright of a slide rail were cited. In addition death certificates revealed that falls and hangings through head entanglement in ropes or chains were the most frequent causes of death.

Home playground equipment-related injuries most often occurred on swings and swing sets. Injuries sustained on public playground equipment most often occurred on slides and climbing apparatus.

Playground surfacing as well as the way the victim landed are factors in the kind and degree of injury incurred. Approximately 90 in-depth investigated cases involved falls to asphalt, cement, or packed dirt playground surfaces. One death was the result of a fall onto asphalt surfacing from a seven foot high slide. It is possible that the degree of injury might have been less serious had the child fallen onto a more resilient surface.

III. METHODOLOGY

The following analysis is based on injury data from three primary sources: The National Electronic Injury Surveillance System; in-depth investigations; the death certificate program and in some instances information from 15(b) Notices. When used each of these data bases is discussed separately and in some cases comparisons are made. These sources are not mutually exclusive, and in some cases the same incident may be reported through two or more sources.

Surveillance Data

The NEISS, which is operated by the U.S. Consumer Product Safety Commission's (CPSC) Bureau of Epidemiology, has been fully operational since July 1, 1972. Designed to develop statistically valid, nationally representative product-related injury data, the NEISS is a computer-based network of 119 statistically selected hospital emergency rooms located throughout the country. Through the application of estimator equations, estimates of product-related injuries treated in all hospital emergency rooms in the continental U.S. can be made from product-related injuries reported through the NEISS. The estimate is made by multiplying the number of product-related injuries reported by each hospital by the weight factor associated with that hospital. The weight factor is different for each hospital since it is a function of the number of emergency room visits and the population within the particular geographic region in which it is located.

Surveillance injury data are transmitted daily to a central computer at Commission headquarters via teletype terminals in the hospitals. Each injury report indicates the type of product involved and provides information

pertaining to the victim and the injury--age, sex, injury diagnosis, body part involved, and disposition of treatment. Based on the injury diagnosis, body part involved, and disposition, a severity rating is assigned to each case.

The NEISS received surveillance reports of 4,769 playground equipment-associated injuries treated in hospital emergency rooms during the period January 1, 1974 - December 31, 1974.

In-Depth Investigations

An in-depth investigation is usually a personal interview with the victim and/or the family or witnesses. During the investigation, the CPSC investigator records demographic data and obtains a detailed description of the accident, and when possible, a sample of the product or products involved. Cases are selected for investigation largely on the basis of the frequency and severity of NEISS-reported injuries associated with the product involved.

Presently, in-depth investigations are conducted by CPSC headquarters and field staff and by private contractors. From 1970 until May 1973, when the Commission became operational, investigations were conducted by the Food and Drug Administration's Bureau of Product Safety. Other investigations utilized by the Commission were conducted prior to 1970 by the former National Commission on Product Safety and by injury study units operating under the U.S. Public Health Service. Detailed information in this report has been provided by 146 in-depth investigations of playground equipment-related injuries conducted from May 1972 - February 1974. A summarization

of the investigations can be found in Appendix A. All in-depth investigation reports are on file at the National Injury Information Clearinghouse of the Commission and are avilable to the public.

For the purposes of this report those injuries which were reported as occurring at home will be treated as related to home playground equipment. Those injuries reported as occurring on farms, at work, on the highway, through assault, or where the place of occurrence was unknown or not stated will be treated as related to miscellaneous playground equipment. Public playground equipment-related injuries will be represented by those which were reported as "other public."

Death Certificates

The procurement of death certificates is directed through the Mortality Branch, Division of Injury Surveillance within the Bureau of Epidemiology of the U.S. Consumer Product Safety Commission. The Commission is working on agreements with 54 health jurisdictions including the 50 states, the District of Columbia, New York City, the Virgin Islands, and Puerto Rico. As of March 1, 1975, 53 jurisdictions (including 49 states) have agreed to supply relevant death certificates (consumer product-related deaths) to the Commission. The contracts specify that each jurisdiction furnish death certificates on a month-to-month basis. It is anticipated that all 54 jurisdictions will be reporting to the Commission by the end of Fiscal Year 1975.

IV. RESULTS

Surveillance Data:

Age and Sex: Seventy-eight percent of the total estimated injuries occurred to children less than 10 years of age. Understandably, children under 4 years of age suffered more injuries on home playground equipment than on public playground equipment. In the 5-9 age group, 10 percent more injuries involved public playground equipment than home playground equipment. Only 5,300 out of the total of 118,000 estimated injuries occurred in the 15 and over age group, and these were divided fairly evenly between the types of playground equipment. In the 10-14 age group more than twice as many victims sustained injuries in accidents involving public playground equipment than home playground equipment. Just over half of all persons injured on playground equipment were male (see Figure 1).

Age and Diagnosis: Table 1 indicates that among children under 5 years of age lacerations and contusions/abrasions were the predominant diagnoses, together representing 75 percent of the injuries to this age group. Fractures and strains/sprains combined to add another 18 percent. The discrepancy between these two major groups of injury diagnoses decreases with age such that in the 5-9 age group 57 percent of the injuries were lacerations or contusions/abrasions, and 36 percent were fractures or strains/sprains and that in the 10-14 and 15 years and older groups, the percentages were almost equal for the two types of injury. Hematomas and concussions together represent 3 percent of the injuries and all other diagnoses totalled four percent.

Figure 1. Playground Equipment Associated Injuries By Age
As Percent of Total Estimated Injuries
January 1, 1974 - December 31, 1974
N = 117,951

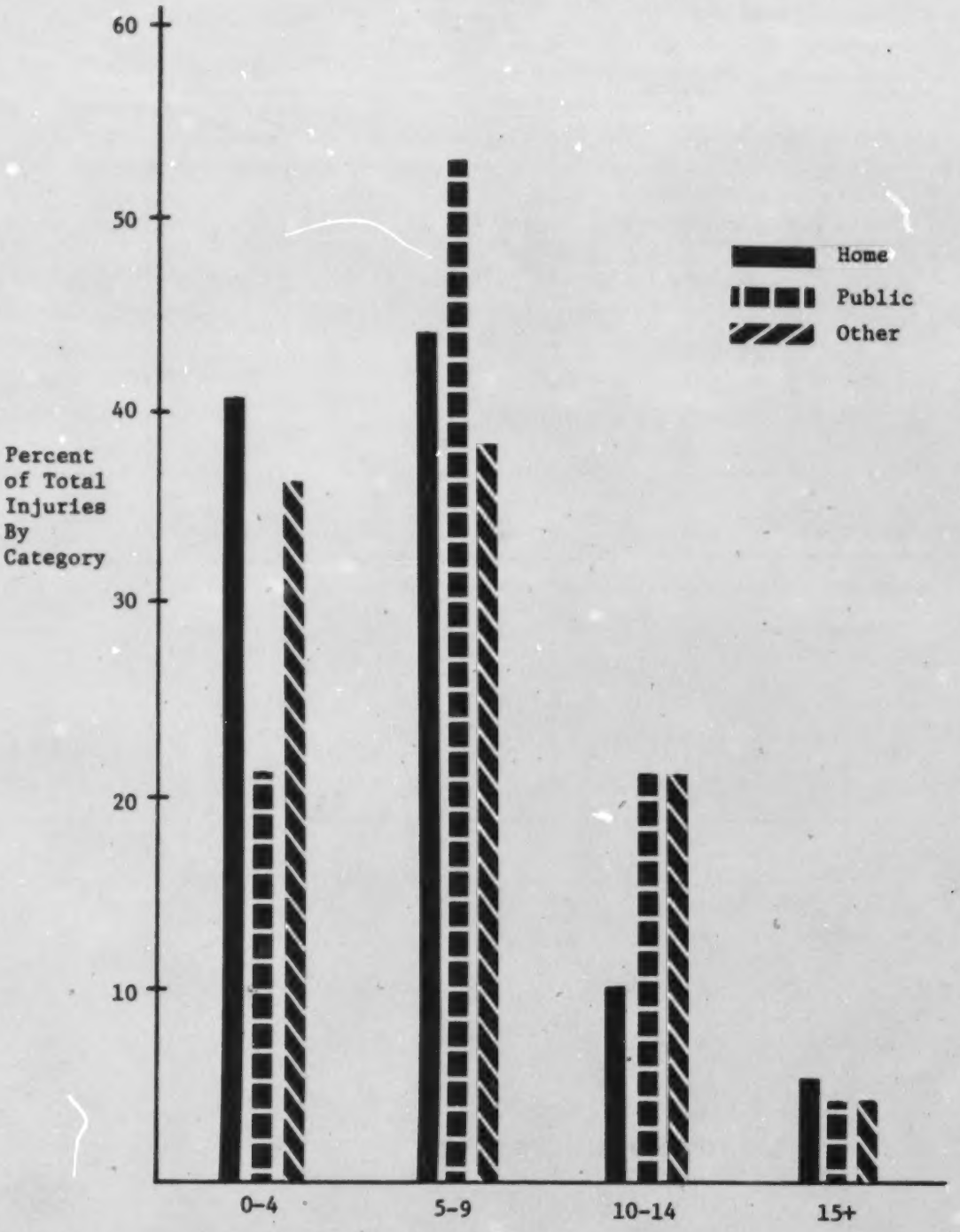

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Table 1. Playground Equipment Related Injuries
By Age and Diagnosis Based on Estimated
Number of Injuries
January 1, 1974 - December 31, 1974
N = 117,951

Diagnosis	Total	Age			
		0-4	5-9	10-14	15+
Total	117,951 (100%)	37,862 (100%)	54,140 (100%)	20,641 (100%)	5,308 (100%)
Lacerations and Contusions/ Abrasions	71,743 (61%)	28,287 (75%)	31,030 (57%)	9,812 (48%)	2,609 (49%)
Fractures and Strains/ Sprains	37,736 (32%)	6,837 (18%)	19,660 (36%)	8,951 (43%)	2,284 (43%)
Hematoma and Concussion	3,905 (3%)	1,467 (4%)	1,620 (3%)	693 (3%)	121 (2%)
Other	4,567 (4%)	1,271 (3%)	1,830 (4%)	1,185 (6%)	294 (6%)

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Diagnosis and Body Part: The estimated number of injuries associated with playground equipment totalled approximately 118,000. Lacerations, contusions/abrasions, fractures, and strains/sprains comprised 93 percent of the estimated injuries for all playground equipment. Specifically, lacerations accounted for 37 percent; contusions/abrasions, 23 percent; fractures, 23 percent; and strains/sprains, 9 percent. The remaining 7 percent were primarily concussions, 2 percent; and hematomas, 1 percent (see Figure 2).

The head, including the face, eye, ear, mouth, and neck, sustained just under half of the total estimated injuries. The remaining injuries were divided 30 percent, upper extremities; 15 percent, lower extremities; and 9 percent, trunk.

Site of Playground Equipment Injuries: The estimated number of injuries was approximately the same for home and public playground equipment, although percentages differed by equipment type. There were approximately 41,000 home and 45,000 public playground equipment-related injuries treated in hospital emergency rooms throughout the United States. Swings and swing sets constituted the product category involved most frequently in home playground equipment-related injuries, accounting for 70 percent. In contrast, playground climbing apparatus (35 percent), slides (28 percent), and swings and swing sets (21 percent) were the product categories more frequently involved in public playground injuries (see Figure 3).

Disposition and Sex: Just over half of all persons injured in accidents involving playground equipment were male. The rate of hospitalization for playground equipment injuries was 5 percent.

Figure 2. Summary of Demographic Characteristics of Estimated Injuries Related to Playground Equipment
January 1, 1974 - December 31, 1974
N = 117,951

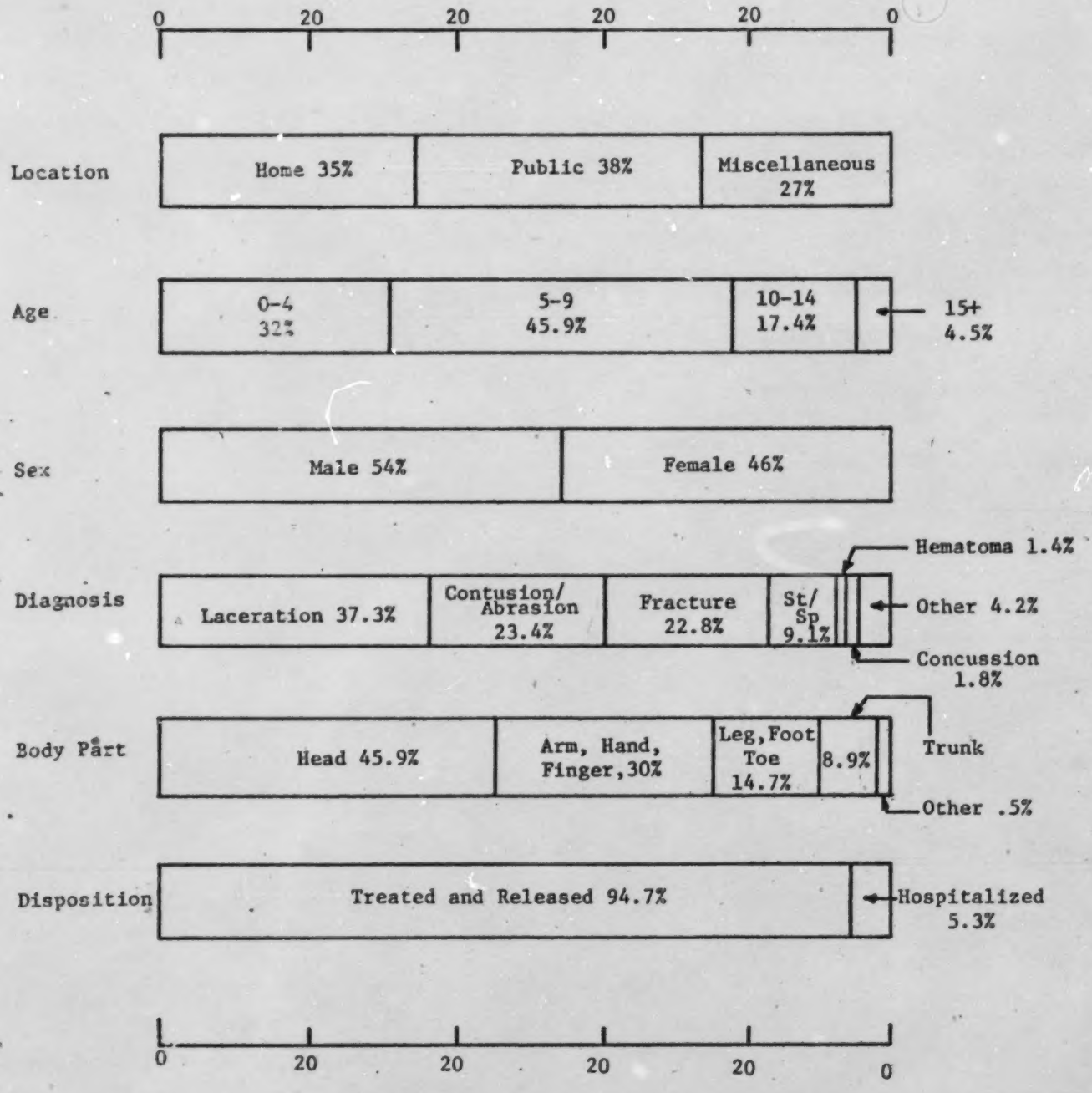

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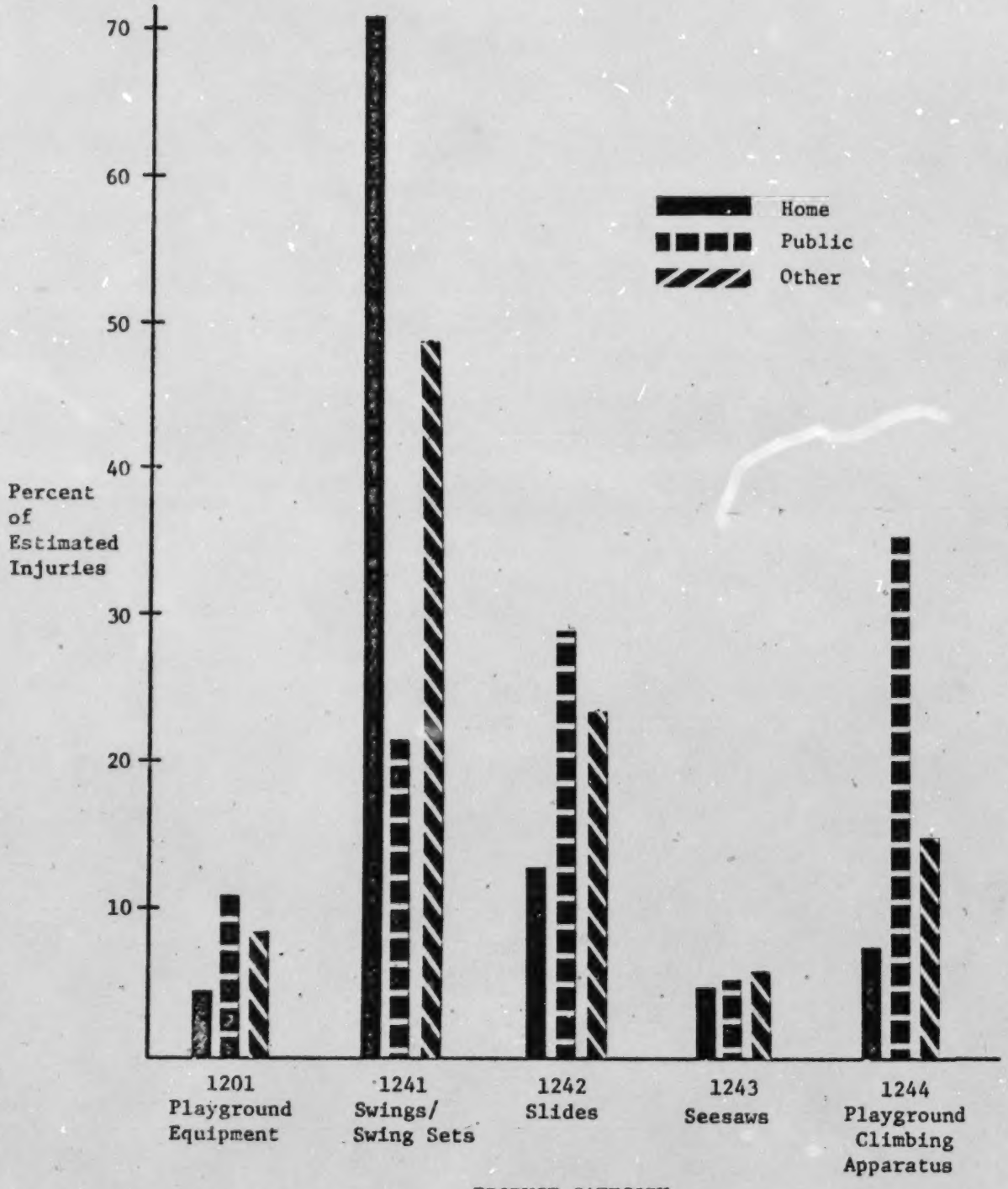
Figure 3. Playground Equipment Associated Injuries By Product Category As Percent of Total Estimated Injuries Treated In Hospital Emergency Rooms
January 1, 1974 - December 31, 1974
N = 117,951



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In-Depth Investigations

In-depth investigations of 146 individual cases were made by field personnel who visited the victim or his family. Eighty-three of these cases involved public playground equipment and 62 cases involved home playground equipment. These cases are summarized in Appendixes "A" and "B."

Public Playground Equipment

The primary hazard with public playground equipment was falls from the equipment either to the ground (52 cases) or onto other equipment (10 cases). Other hazards include being struck by a moving piece of equipment such as swings and gliders (5 cases), entrapment of an extremity at pivot and pinch points (4 cases), and protruding bolts (2 cases).

The breakdown of the in-depth investigations into individual product categories was as follows:

Slides:

side	8 cases
ladder	5 cases
platform	4 cases
other	8 cases

Climbing apparatus:

monkey bars	15 cases
jungle gym	11 cases
chinning bar	5 cases

Swing set (component parts):

swing	7 cases
glider	1 case
rings	1 case
trapeze bar	1 case

Merry-go-round: 5 cases

Seesaw: 6 cases

Miscellaneous:

rope swing	1 case
tire swing	1 case
concrete moose	1 case
tubmobile	1 case
toy box	1 case
wooden sandbox	1 case

Product Categories

Slides:

Falls over the side (9 cases), from the platform (4 cases), and from the ladder (5 cases) comprised three-fourths of all the slide cases on public playground equipment. Roughhousing, walking up or down the slide, losing grip, slipping, and losing balance were factors cited in falls on slides. In one case the victim was pushed from behind by a playmate while playing on the slide platform and fell 6 feet. The playmate, in turn, was pushed and fell on top of the victim. A fractured leg was the result. Protruding bolts, striking slide rim and edge, and slipping on ladder striking steps were other notable factors causing injuries on slides.

Climbing Apparatus:

Monkey bars (15 cases), jungle gyms (11 cases), and chinning bars (5 cases) were the types of climbing apparatus involved in public playground accidents. Falls to the ground (13 cases) were the primary cause of injuries. One 10-year-old victim expired in the hospital 3 days after he lost his grip on the monkey bars and fell to the asphalt surfacing striking his head.

Factors cited in falls were slipping, losing grip, and loss of balance. Play characteristics noted in climbing apparatus accidents were swinging from rung to rung, climbing, stunting, and jumping on or from bars.

Swings/Swing Sets:

In swing-set related cases seven occurred on swings and one each on a glider, a trapeze bar, and a set of rings. Losing grip and falling (3 cases), and being struck by a swing in motion (4 cases) were the causes of injury on swings. A moving glider resulted in a strain/sprain to the back when the 4-year-old victim put her head between the two support bars.

Merry-go-round:

Five injuries on public playground equipment occurred on merry-go-rounds. The push-pull apparatus that regulates the merry-go-round was apparently responsible for the amputation of a finger in one case. Another child dislocated his fingers when they were caught in the handgrip. While a merry-go-round was in motion one child lost his grip and flew off the apparatus; another lost his balance while sitting on a sloping bar. In the last case the victim was lying beneath the merry-go-round sticking his arm up the center when it was caught. The result was a fractured arm.

Seesaws:

Six injuries occurred on seesaws. Three of these cases were falls while the victim was on the "high end" of the seesaw. A broken torsion spring, causing one end of the seesaw to abruptly strike the ground, and attempting to mount were other factors cited which resulted in injuries.

Home Playground Equipment:

In accidents related to home playground equipment, falling (41 cases) was the most prevalent pattern of injury. Striking equipment or being struck by moving apparatus (8 cases), strangulation by clothing (2 cases), entrapment of an extremity at pinch points (2 cases), rough edges and protruding bolts (3 cases) and foot becoming wedged between ground and glider or seesaw (2 cases) were other factors leading to injury.

The breakdown of the in-depth investigations into individual product categories was as follows:

Swings/Swing Sets (component parts)

Swings	13 cases
Glider	9 cases
Trapeze swing	2 cases
Top horizontal ladder	2 cases
Lawn swing	1 case
Cross bar of A-frame	4 cases
Frame	4 cases
Slides	12 cases
Climbing Apparatus	
Jungle gym	6 cases
Seesaw	4 cases
Merry-go-round	1 case
Miscellaneous	
Rope swing	1 case
Homemade bucket seat swing	1 case
Horizontal plastic ground slide	1 case
Sandbox	1 case

Product Categories

Swings:

Falling off (8 cases), being struck by swing (3 cases), seat breaking in half (1 case), and rough edge (1 case) resulted in injuries on swings. A 2-year-old was admitted to the hospital when she suffered a fractured skull after a fall caused when the seat of the swing tilted in such a way that the metal A-frame of the seat slid through the support chain loop.

Glider:

Falls (4 cases), being struck by glider (3 cases), stopping glider (1 case), and entrapment of finger in hinge (1 case) were the causes of injuries on gliders. A 5-year-old girl sustained a contusion-avulsion of her fingers while she stood on top of an adjacent sliding board and rocked the glider by pulling on it at the top near the hinge. Her fingers became entrapped in the hinge.

Trapeze:

Climbing from A-frame crossbar to trapeze, and hanging by knees led to injuries in two cases. While climbing onto the trapeze from the A-frame a 3-year-old fell off suffering a fracture of the upper leg. An 8-year-old boy slipped and fell to the ground while hanging from his knees. He sustained a contusion of the elbow.

Top Horizontal Ladder:

There were two cases involving the horizontal ladder. A 3-year-old boy was pushed off the top by a playmate. He fell 8 feet and sustained a concussion. In the second case the ladder to the top had been removed to prevent the 3-year-old from climbing onto it. Nevertheless, victim hoisted himself up by means of a crossbar to the catwalk roof. He stepped on a board (not associated with the apparatus) on its unsupported end and fell 8 feet to the ground. He sustained a fractured leg.

Lawn Swing:

There was one case involving a lawn swing, A 2-year-old being pushed in the swing fell out, lacerating her head.

Crossbar of A-frame:

Four cases involved the crossbar of the A-frame. Stunting was the factor leading to injury on the crossbar. In one case the victim struck a protruding bolt.

Frame:

There were four accidents involving the frame of a swing set. In two cases the frame support was loose from its mooring with the top bar of the set. In one case the victim was anchoring the swing set by standing on the crossbar of the A-frame. The support poles came loose at their mooring. The victim's hand was trapped in the joint at the apex. Two adults had to force the joint open to free victim. In another case the supports worked loose from their mooring causing the swing set to lean forward. The victim fell from her seat fracturing her fingers. In still another case the swing set fell over entirely and the victim, struck by a side support bar, sustained a laceration to his head.

Slide:

Twelve injuries on home playground equipment occurred on slides. There were two cases where girls, aged 2 and 4, were strangled when the poncho each was wearing caught on a vertical member of a slide railing. Five injuries resulted when the victims fell over the side of a slide. Factors cited here were running or walking down slide, and climbing up the slide among other less clearly defined precipitating activity. Fractures were a common

diagnosis for such falls. Other injuries occurred when victims fell backward off the slide platform; struck a protruding bolt while sliding down on the stomach; or fell off the slide onto another piece of equipment (2 cases).

Climbing Apparatus:

There were six injuries sustained on climbing apparatus. All of these were on jungle gyms and involved falls. Five of the victims sustained fractures, three to the arm and two to the leg. Factors leading to injury on jungle gyms were jumping off platform, stunting, retreating down ladder, swinging on the rungs and sliding down a fireman's pole.

Seesaws:

Three injuries occurred on seesaws. Two victims fell off the seesaw while the end on which each was sitting was in the air. Another victim's foot was pinned between foot support bar and concrete ground surfacing after his foot slipped off the foot bar.

Merry-go-round:

One person sustained a lacerated lower lip when he tripped over the base of the merry-go-round while playing.

Supervision:

Cited in the in-depth investigations was the fact that adults were present at the time of the injury in only four cases. In 38 cases the victim was with at least one other child. In 12 cases the victim was alone at the time the injury occurred. In two cases, where the victims were alone at the time, the same type of accident occurred in each instance and resulted in two fatalities. In each case, the girls, aged 2 and 4, strangled after the poncho each was wearing caught on an upright portion of the slide railing.

Disposition:

Overall in investigations related to playground equipment there were 5 deaths; 103 treated and released; 37 hospitalized; and 1 unknown.

On home playground equipment 3 victims died, 11 were treated and hospitalized, and 48 were treated and released or not treated. Two of the three deaths were strangulations which occurred when ponchos caught on uprights on slides, the remaining one occurred when an adult male flopped onto a ground slide, breaking his neck.

On public playground equipment, two victims died as a result of falls from playground bars, one suffered head injuries and the other a skull fracture. There were 54 victims treated and released, 26 treated and hospitalized and one case in which the disposition was not known.

Death Certificates

From July 1973 through October 1974, the U.S. Consumer Product Safety Commission received 24 death certificates for injuries related to playground equipment. Of these, 15 occurred at home and 9 occurred in public. Eleven deaths were a direct result of falls. Eight deaths resulted from hanging. Three of the deaths were caused by part of a swing set striking the victim. Of the two remaining deaths, one occurred when a swing set collapsed, and the other resulted from a fall into the swing set.

Thirteen of the victims were between the ages of 5 and 9 years. Seven were under 5 years of age. Two were between the ages of 10 and 14 years. Two victims were over 15 years of age; one of these was 63 years old. Fifteen of the 24 victims were male. Thirteen of the injuries were to the head, nine to the neck, one to the trunk, and one was unknown.

TABLE 2. DEATHS RELATED TO PLAYGROUND EQUIPMENT
DEMOGRAPHIC CHARACTERISTICS OF VICTIMS

N = 24

Location:

Home	Public
15	9

Pattern:

Falls	Hanging	Struck by swing part	Other
11	8	3	2

Age:

0-4	5-9	10-14	15+
7	13	2	2

Sex:

Male	Female
15	9

Body Part Injured:

Head	Neck	Trunk	Other
13	9	1	1

SOURCE: U.S. CONSUMER PRODUCT SAFETY COMMISSION
Bureau of Epidemiology

V. DISCUSSION

Falls to the ground and onto other equipment have been shown to be the major hazard with playground equipment. Eleven death certificates involving swings, slides, and other playground equipment indicated falls as the cause of death. The Product Investigation Report, Contract No. FDA 73-6, prepared by the Accident Prevention Laboratory of the University of Iowa was received by the Commission October 1973. At the beginning of the report it states:

> "Playground equipment accident statistics demonstrate a high incidence of injuries, and though not generally classed as permanent in nature do include an abundance of head injuries which can result in a variety of permanent damage states ranging from minor brain damage to death. The risk is real and the potential for the most severe injury is imminent with every fall." *

Head injuries resulting from falls to ground were the cause of death in 2 in-depth investigations, 1 for a 10-year-old girl and 1 for a 10-year-old boy. In one case the victim lost her grip on a horizontal bar of a climbing apparatus (monkey bars) and struck her head on the asphalt surfacing directly under the bars in a city park. In the second case the victim fell 7 feet from climbing apparatus (jungle gym) and struck his head on the asphalt playground surface.

Both of the above in-depth investigations indicated that the victim fell onto the asphalt surfacing below the climbing apparatus. Although the type of (public) playground surfacing could not always be determined from the in-depth investigations, a substantial number of the falls occurred on concrete, asphalt, or hard-packed dirt surfacing.

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* The University of Iowa Institute of Agricultural Medicine, Accident Prevention Laboratory, Product Investigation Report: Public Playground Equipment (Contract No. FDA 73-6, October 15, 1973), p. 1.

In the cases where the victim reportedly fell onto a safety matting below the apparatus, it was questionable whether any degree of protection was offered. Fractures were still a common diagnosis for these falls onto safety matting.

Hanging is a serious and frequent hazard as shown by the death certificates. Eight death certificates indicated that the victim had been hanged generally by the chain or rope supporting the swing.

Some safety measures have apparently been taken by manufacturers; however, accidents have occurred despite these measures. Two primary examples are protective caps on protruding bolts and pipe ends and anchorage for swing sets on home playground equipment. In 1 case a 3-year-old girl stood on top of the slide and reached for the protective plastic cap that covers the end of a pipe along the top of the swing set. It came off in her hand. She lost her balance and fell off the slide, striking her head on the horizontal A-frame bar.

Respondents have mentioned that cap coverings over protruding bolts repeatedly came off. As for anchorages, there was no injury reported involving improper anchoring, but respondents have indicated refusal to use the stake-like anchoring because they frequently came out of the ground, presenting further hazards.

An important factor to be considered in the development of safety standards is the behavior pattern of children around playground equipment. More often than not, the child's behavior was other than the use for which the equipment was designed. Walking up and down slides, climbing onto any aspect of playground apparatus that allowed a grip or foothold, and roughhousing were evident in the in-depth investigations.

In the in-depth investigations, one part of home playground swing sets was repeatedly mentioned to be involved in injuries sustained. The A-frame crossbar (side support poles of swing set shaped as an "A") was used for stunting, climbing, and jumping. Falls from slides that were attached to the A-frame were often onto the crossbar. In addition, the crossbar was close to other pieces of the swing set such as gliders, swings, and seesaws. Falls from one of these, whether from the standing or sitting point, found the victim coming in contact with the crossbar or falling onto the aforementioned equipment from the crossbar itself.

The National School Supply and Equipment Association is presently working with members of the industry on a voluntary standard. This standard is being used, with some modifications, by at least one manufacturer.

The U.S. Consumer Product Safety Commission has expressed its intention to proceed with the development of mandatory safety regulations for both public and home playground equipment under the provisions of the Federal Hazardous Substances Act.

VI. REFERENCES

1. The University of Iowa Institute of Agricultural Medicine, Accident Prevention Laboratory. Product Investigation Report: Public Playground Equipment. Contract No. FDA 73-6, p. 1. October 15, 1973.

2. Yeager, Earl T. Industry Profile on Home Playground Equipment. Contract No. CPSC-C-74-195, Task No. 8002, pp. 1-9. Columbus: Battelle, Columbus Laboratories; July 1974.

APPENDIX "A"

SUMMARIZATION OF 62 IN-DEPTH INVESTIGATIONS OF PRODUCT RELATED INJURIES:

HOME PLAYGROUND EQUIPMENT (1201, 1241-1244)

April 1975

U.S. CONSUMER PRODUCT SAFETY COMMISSION

Bureau of Epidemiology

SUMMARIZATION OF 62 IN-DEPTH INVESTIGATIONS OF PRODUCT RELATED INJURIES: HOME PLAYGROUND EQUIPMENT (1201, 1241-1244)

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SWINGS								
PATTERN: Fell								
A17420	4/17/73	3	F	Lying on seat of swing	Victim was lying on plastic seat and fell from it to the hard ground of her backyard.	Abrasions/face	Treated & Released	Swing set Dyra-Cool Gym Dandy
A01875	6/22/73	2	M	Seat of swing tilted back	At neighbor's house, victim was swinging, seated at such an angle as to cause the seat to tilt in a way that the A-frame of seat could slide through the support chain loop causing the seat to tilt 90° clockwise. The victim fell off backwards.	Fracture/skull	Treated & Admitted (2 D)	Swing set Sears
A21203	4/22/73	7	M	Jumping off moving swing	Victim, attempting to be daring, jumped off neighbor's swing while it was in motion. He landed on his arm.	Fracture/right lower arm	T & R	Swing set
A25795	2/22/74	7	F	Jumping off moving swing	Victim was swinging in yard, and intentionally jumping off at different heights. After doing this several times, she landed improperly on her leg and suffered the injury.	Fracture/lower left leg	T & R	Swing
A16982	3/3/73	3	F	Pushed off	In backyard, victim was accidentally pushed off the swing seat by a friend. She struck her head in the dirt.	Contusion/ forehead	T & R	Swing set/ Gym Dandy "Dura Cool"
A17488	7/31/71		M	Fell off swing	Victim simply fell off the swing seat and onto the cement patio of his backyard.	Contusion/ head	T & A	Swing set/ Sturdy Line
PATTERN: Lost Grip								
A01853	3/5/73	4	F	Swinging high	Victim had swung too high and lost her grip on the lightweight swing chains. The momentum carried her on to a cement patio about 2 feet away in backyard.	Concussion/ brain	T & A (1 D)	Child's swing set/ Carousel/ Turco

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SWINGS							
PATTERN: Lost Grip (cont.)								
A04805	6/7/73	6	M	Swinging standing up	Victim was standing on swing seat. As he went higher, his grip loosened and he fell to the ground. Occurred at home.	Fracture/right forearm	T & R	Swing set/ Sears
A04978	3/11/73	4	M	Playing in front of swing set	As some playmates were on the swing in a neighbor's yard, victim and another child began shoving each other. Victim was pushed to the ground in the path of one of the swings, and was struck by the plastic edge of the seat.	Lacerations/ face	T & R	Swing set/ Gym Dandy
A04858	3/27/73	10	M	Swing pushed at victim	Victim was standing behind neighbor's swing set, when playmate pushed swing at him.	Lacerations/ forehead	T & R	Swing set
A13147	3/11/73	3	F	Pushed or fell off swing	Was playing on neighbor's swing when victim was either pushed or fell off the swing seat. As the seat returned it struck her.	Lacerations/ forehead	T & R	Swing
PATTERN: Seat Broke in Half								
A04925	5/29/73	8	F	Swinging	Victim was in the yard swinging on the swing when the plastic seat broke in half down the middle, dumping her on the ground. The seat was made of thin plastic and was hollow.	Contusion/lower arm	T & R	Plastic swing seat/ Irwin Swing-N-Play Bumble Bee
PATTERN: Rough Edge								
A17316	2/26/73	4	M	Playing on swing set	Was playing on old rusty swing set in backyard. It has many rough edges. The boy's finger was cut on the hinge supporting the swing.	Laceration/ finger	T & R	Swing set
A05122	9/20/73	2	F	Reaching toward friend	Victim was on swing beside the glider on a neighbor's swing set. She was attempting to reach out and touch her friends on the glider. She leaned over too far and fell onto the glider.	Laceration/ lip	T & R	Swing set Gym Dandy

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	GLIDER							
PATTERN: Fell								
A04927	5/23/73	3	F	Holding grip with one hand	Victim was on backyard glider, holding hand grip with one hand and eating a cookie with the other. While swinging back and forth she lost her grip and fell off backward.	Fracture/ right leg	T & R	Teeter-totter of swing set Sears
A21927	6/3/73	5	F	Attempting to jump on moving glider	Victim was pushing her sister who was on the glider of a neighbor's swing set. When the glider had built up momentum, the victim tried to jump on, missed, fell under the glider, and was struck by it.	Laceration-contusion/ eye, cheek	T & R	Swing set
A04808	5/13/73	5	M	No hand gripe on glider	Four children were playing on a glider at a friend's house. As they were swinging, victim fell or was pushed from glider and landed on brick laying in the yard.	Contusion/back	T & R	Swing set glider
A13143	3/29/73	3	F	Undetermined	Somehow, victim fell off glider of swing set in neighbor's yard. Possibly she was going too high.	Lacerations/ forehead	T & R	Swing set/ Coolvent/ Blaron
PATTERN: Struck by Glider								
A21003	4/7/73	3	M	Running behind moving glider	Victim was playing in backyard with friends when he ran behind the swing and was struck by a horizontal bar supporting the seat of a moving glider.	Lacerations/ face	T & R	
A17760	2/7/73	5	M	Pushing with feet while lying on back	Victim was lying on his back in the backyard and pushing the glider with his feet. He pushed it hard and couldn't move fast enough to avoid the return swing, the glider brushed his face.	Lacerations-Abrasions/face	T & R	Swing set

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	GLIDER (cont.)							
PATTERN:	Struck by Glider (cont.)							
A11978	9/20/73	9	M	Playing near moving glider	Victim was playing tag around the swing set and was struck by the moving glider. Occurred at home.	Lacerations/chin	T & R	Swing set/ Sears
PATTERN:	Stopping Glider							
A21058	5/13/73	5	F	Foot wedged beneath glider	Victim stuck out her foot to stop glider when her foot became wedged underneath it. The swing set had sunk into the ground of her back-yard and the glider's footboard was only 2" off the ground.	Fracture/right lower leg	T & R	Glider of swing set
A21297	5/29/73	5	F	Pushing glider near the top hinge	Victim was standing on top of adjacent sliding board. She was rocking the glider by pulling on it at the top near the hinge. Her finger became trapped in the hinge. Occurred at home.	Contusion-Avulsion/ fingers	T & R	Swing set/ Channel Master
	SWING SET - TRAPEZE SWING							
PATTERN:	Fell							
A07266	2/18/74	3	F	Climbing from A-frame crossbar to trapeze	Victim climbed from swing seat to crossbar of A-frame, holding onto the side supports of frame. She then tried to climb onto the trapeze from there, but fell instead. Occurred at home.	Fracture/left tibia	T & R	Swing set/ Tiche's
PATTERN:	Slipped Off							
A21926	5/29/73	8	M	Hanging by knees	On trapeze bar of backyard swing set, victim was hanging by his knees and trying to pull himself up into a sitting position. During one attempt, he slipped to the ground, striking his elbow.	Contusion/elbow	T & R	Swing set/ Blazon

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SWING SET - TOP HORIZONTAL LADDER								
PATTERN: Fell								
A02008	9/1/73	3	M	Climbing to ladder	Swing set had catwalk across the top. Victim's older brother had placed boards across it to give it a roof. Ladder was removed to prevent victim from reaching it, but victim hoisted himself up by means of a crossbar to the catwalk roof. He stepped on a board on its unsupported end and fell 8 1/2" to ground. "Thought to be hyperactive."	Fracture/left clavicle	T & A (1 D)	Swing set/ Sears
A20032	9/22/73	3	M	Pushed off while climbing across	Victim was playing on a gym-swing set in his backyard. He was trying to climb across the top of the horizontal ladder at the top of the swing set when a playmate pushed him. He fell about 8' into the mud.	Concussion	T & A (3 D)	Swing set/ Sears Roebuck
SWING SET - LAWN SWING								
PATTERN: Fell								
A06468	11/14/73	2	F	Distracted	At babysitter's home, victim was being pushed in a two-seater swing by a 3-year-old playmate. She was distracted, watching the other children. She lost her hold and fell to the ground, striking her head on a metal piece laying on the ground.	Lacerations/ head	T & R	Swing set/ Gym-Dandy
SWING SET - CROSS BAR OF A-FRAME								
PATTERN: Struck Head on Glider Seat Handle								
A22554	4/15/73	3	F	Climbing onto crossbar	Victim climbed on to a crossbar of her backyard swing set. She leaned back and struck her head on a glider seat handle bar.	Contusion-Abrasions/ head	T & R	Swing set/ Tubco/ "The Daisy"
PATTERN: Struck Protruding Bolt								
A12777	3/8/73	5	F	Swinging on crossbar	Victim, standing on attached slide and holding onto A-frame, was swinging down underneath it when her arm was caught by a protruding bolt on swing set. Set belonged to neighbor.	Laceration/ upper right arm	T & R	Swing set/ Sears

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SWING SET - CROSS BAR OF A-FRAME (cont.)								
PATTERN: Lost Grip								
A22518	3/2/73	12	F	Stunting	Victim was doing a gymnastic stunt called the "Penny Drop" on the crossbar of the swing set in neighbor's yard. She released her hand too late and landed on face rather than her feet.	Dislocated/left elbow	T & A (2 D)	Swing set
PATTERN: Fell								
A00301	10/1/73	6	F	Stunting	Victim was attempting to do a back flip on the crossbar of the A-frame of the set. She lost her balance and fell to the ground, approx. 4' below. Occurred at home.	Fractured/ elbow	T & A (16 D)	Swings
PATTERN: Struck by Side Support Bar								
A05038	8/18/73	2	M	Swing set fell over	Victim was swinging simultaneously with playmate on second swing. As they went higher the entire apparatus fell over. The victim was struck by a side support bar on the ground.	Laceration/ head	T & R	Swing set
PATTERN: Hand Trapped in Joint at Apex of A-Frame								
A21234	5/1/73	7	M	Standing on crossbar	Victim was anchoring backyard swing by standing on crossbar between A-frame while his brother was swinging. His hand was trapped in joint at apex of the A-frame. Two adults had to force the joint open to free victim's hand.	Contusion/ hand	T & R	Swing set
PATTERN: Ran Into Frame								
A05039	8/21/73	6	F	Running around swing set	Victim was running home because night was falling. As she ran around neighbor's swing set, her cheek contacted the frame.	Laceration/ face	T & R	Swing set/ Gym Dandy
PATTERN: Fell From Swing								
A05178	6/24/73	4	F	Swing set leaned forward	As victim was swinging back and forth on private swing one of the frame supports worked loose from its mooring with the top bar of the set. The entire set leaned forward and the victim fell from her seat.	Fracture/ fingers	T & R	Swing set/ Gym Dandy

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDE - SWING SET							
PATTERN: Strangulation								
A23081	8/13/73	4	F	Poncho caught on angular upright of rail	Victim's knitted poncho was caught on outside railing of a slide attached to the swing set as she was going down the slide at home.	Strangulation	Dead on Arrival	Slide & swing set Sears/Turc
A20089	11/6/73	2	F	Poncho caught on angular upright of rail	As the victim attempted to slide down slide her poncho caught on the railing of the backyard slide and was strangled. No adults were present and the slide set was destroyed before the investigation.	Strangulation	D O A	Slide and swing set
PATTERN: Fell Off Side								
A17862	7/18/73	22 mo.	M	Running down slide	Attempted to run down slide. As he was doing so, a friend called and he turned his head. At this point he lost his balance and fell off the side of the slide, according to adult witness, victim had never been on slide before.	Fracture/ left arm	T & A (1 D)	Backyard swing set/ Turco Mfg. Co.
A05131	10/10/73	6	F	Walking down slide	While walking down slide, victim lost balance and fell over side onto ground in backyard. The set, assembled by father, was in poor condition with exposed bolts and metal edges.	Fracture/ right wrist	T & R	Slide & Swing set/ Turco
A17823	8/18/73	2	M	Climbing up slide	Was attempting to climb up slide in neighbor's yard. Near the top he lost his balance and fell off the left side of the slide, striking the ground.	Fracture/left radius and ulna	T & R	Slide & Playhouse set
A16979	2/27/73	4	M	Sliding down	While sliding down slide, fell off edge to cement paved front yard.	Laceration/ forehead (4 stitches)	T & R	Swing/slide set, Turco Mfg. Co.
A07265	2/17/74	2	M	Undetermined	Victim climbed the ladder of a slide in his backyard and either in his attempt to sit down or intending to slide down on his stomach he went over the side.	Fracture/ left clavicle	T & R	Slide & swing set

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CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDE - SWING SET (cont.)							
PATTERN: Fell Backward								
A05124	9/23/73	23 mo.	M	Jumping on slide platform	Was jumping on top of slide. Lost balance and fell backward down ladder, striking his head on a rung. The slide, in his backyard, was in a "poor and hazardous condition."	Laceration/ head	T & A	Slide & swing set
PATTERN: Protruding Bolt								
A24019	5/6/73	8	M	Sliding down head first	Went down slide head first and struck head on protruding bolt near bottom. Mother believes he was pushed in backyard.	Laceration/ head	T & R	Sliding board & swing
PATTERN: Lost Balance								
A15186	10/2/73	3	F	Fell onto cross-bar of A-frame	Victim was standing on top of slide and reached for plastic protective cap that covers end of pipe along the top of the swing set. It came off in her hand. She lost her balance and fell off, striking her head on the horizontal bar A-frame. Occurred in backyard.	Laceration/ eyebrow	T & R	Swing set/ Gym Dandy "Dare cool"
PATTERN: Fell onto Glider								
A22529	3/16/73	22 mo.	F	Shifting body to go down slide	Victim climbed ladder and attempted to shift body so as to go down slide correctly. In doing so she went off the opposite side of slide and fell 4 ft. striking face on glider. Occurred in backyard.	Contusion/ face	T & R	Slide & swing Carousel/ Sears
PATTERN: Undetermined								
A07215	11/26/73	3	M	Sliding down and rolling on to ground	Victim had been sliding down slide in backyard and then rolling on the ground. Injury may have occurred when the victim was rolling.	Fracture/ collar bone	T & R	Slide & swing/ Gym-Dandy, Inc.

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
CLIMBING APPARATUS - JUNGLE GYM								
PATTERN: Fell								
A01806	4/4/73	4	M	Jumped off platform	Victim jumped off wooden platform on neighbor's climbing bars, falling 2-1/2' to the grass below. Bars were in poor condition.	Fracture/lower right arm	T & A (1 D)	Jungle Gym climbing bars, Sears
A13159	5/7/73	8	M	Stunting	Victim, attempting to sit on the horizontal section of bars, grip the side bars and fall over backwards to a standing position, landed instead on his side in the grass of his backyard.	Fracture/ left ulna	T & R	Jungle Gym
A25915	2/22/74	4	M	Swinging from rung to rung	Victim was trying to swing from rung to rung though he was expressly forbidden by his parents to use the backyard set. He couldn't maintain his grip and fell to the ground.	Fracture/left radius and ulna	T & R	Monkey bar
A25076	12/4/73	7	M	Tripped over board placed across bars	Victim was climbing the set in his backyard and tripped over a piece of plywood he had placed crosswise between the bars. He fell approximately 6' into the mud. Set was resting lopsided and not secured to the ground.	Abrasion/ right forearm	T & R	Jungle Gym playground set Toys R Us
PATTERN: Slipped								
A17138	1/1/73	2	M	Retreating down ladder	Victim slipped away from mother and went into backyard with brother. He partially climbed up the ladder to the playtower before brother caught him and ordered him down. As he was retreating down ladder he slipped and struck his leg on the metal divider.	Fracture/ lower left leg	T & R	Playtower
PATTERN: Lost Grip								
A01872	5/26/73	3	M	Sliding down fireman's pole	Playing with brand new set of bars in his backyard, victim was sliding down a pole, fireman style, when he let go 2-1/2' from ground and fell to the grass.	Fracture/ left tibia	T & A (1 D)	Jungle gym Gym Dandy

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SEE-SAW								
PATTERN: Fell Off								
A09078	11/13/73	6	M	Standing on raised end	Playmate stood up on his end of a homemade seesaw in neighbor's yard while victim's end was up in the air. While in the position victim lost his balance and fell to the ground.	Abrasion/nose	T & R	Seesaw/ homemade
21115	4/16/73	18 mo.	M	Lost balance	Victim was riding on seesaw with older sibling in backyard. Sibling was going high and victim got giddy, lost his balance, and fell forward to the ground.	Contusion/ nose	T & R	Swing set/ Kenco
PATTERN: Foot Pinned Between Bar and Concrete								
A23020	7/26/73	3	F	Foot slipped from foot-bar	Playing on three seat seesaw in neighbor's backyard. Victim was in middle seat when foot slipped from metal foot support bar and was pinned between bar and patio concrete. It was not possible to fit her foot under the bar when the apparatus is in motion.	Contusion/ left foot	T & R	Seesaw Dura-Cool Gym Dandy
MERRY-GO-ROUND								
PATTERN: Playing Near Merry-Go-Round								
A24569	8/22/73	2	M	Tripped over base	While playing in neighbor's backyard, victim tripped and fell over tripod-like base of stationary merry-go-round and fell to ground lacerating lip.	Laceration/ lower lip	T & R	Merry-Go-Round
MISCELLANEOUS - ROPE SWING								
PATTERN: Let Go Of Rope								
A17762	1/28/73	10	M	Fell on metal chain	Was swinging on a rope hanging in neighbor's backyard. He let go and fell on a metal chain lying in the yard.	Laceration/ eyelid	T & R	Rope swing

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
MISCELLANEOUS - HOMEMADE BUCKET SEAT								
PATTERN: Foot Caught in Fence								
A22076	6/18/73	13	M	Swinging near fence	Victim was swinging in bucket swing in neighbor's yard, with his feet dangling out. The swing was near a chain link fence. The victim's foot was caught in this fence.	Laceration/ right foot	T & R	Homemade bucket swing
SLIDE - HORIZONTAL (Ground Level)								
PATTERN: Belly-Flopping Onto Slide								
A29566	7/1/73	32	M	Head snapped up	Victim took a 12 foot start and did a belly flop on "slip-n-slide." Neighbor said as he landed his head snapped up. It is uncertain whether his head struck the surface. When he slid to a stop he couldn't move. Slide is of a plastic material that is positioned on ground. Water from hose runs over it. Use requires that a person run and flop on his stomach sliding across plastic.	Fracture/ neck with spinal cord involvement	Expired (39 D)	"Slip-N-Slide Whamo"
MISCELLANEOUS - SAND BOX								
PATTERN: Fell Off Playhorse								
A21221	5/19/73	2	M	Struck sandbox	Victim was riding a play horse in backyard when it upset and he struck his head on the edge of a homemade wooden sandbox. This is a guess as there were no witnesses present.	Laceration/ right ear lobe	T & R	Wooden sandbox

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION

Abbreviations Used In This Analysis

M - Male
F - Female
T & R - Treated and released from emergency room
T & A - Treated and admitted for hospitalization
(#D) - Number of days hospitalized. If no (#D) is given it can be assumed the number of days was not reported under "Treated and Admitted for Hospitalization."
D O A - Dead on Arrival in hospital emergency room.

Source: In-depth investigations are conducted by the U.S. Consumer Product Safety Commission's (CPSC) headquarters and field staff and by private contractors throughout the country. Information presented in this summary pertains only to the cases cited. The data are not statistically representative of all injuries associated with this product. All in-depth investigation reports are on file in the National Injury Information Clearinghouse of the U.S. Consumer Product Safety Commission.

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APPENDIX "B"

DISTRIBUTION OF 62 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH HOME PLAYGROUND EQUIPMENT (1201, 1241-1244)

BY PART OF EQUIPMENT INVOLVED AND PROBABLE CAUSATIVE FACTOR

April 1975

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DISTRIBUTION OF 62 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH HOME PLAYGROUND EQUIPMENT (1201, 1241-1244)
BY PART OF EQUIPMENT INVOLVED AND PROBABLY CAUSATIVE FACTOR

Part of Home Playground Equipment Involved	No. of Accidents	Probable Causative Factor				Hazard Pattern	Possible Preventive Mechanical Measures Related to Development of Standard
		People-Related	Product-Related	People & Product-Related	Unknown		
Total	62	24	18	17	3		
Swing Set:							Assure that design and construction is relevant to age groups of intended users.
Swings	11	6	3	2		Fell, loss of grip	Change in design and construction to: . eliminate excessive lightness and flimsiness of chain, seat, and other parts of equipment.
Swing Seat	2		2			Seat broke Seat tilted	Change in design and construction to: . assure sufficient strength of plastic seats . prevent chain slipping from seat hooks
Lawn Swing	1	1				Fell	None
Trapeze Bar	2		2			Fell	Change in design and construction to: . prevent access from A-frame crossbar to other equipment and falls thereof . lower height of trapeze
Top Horizontal Ladder	2			2		Fell	Eliminate top horizontal ladder.
Pendulum Seesaw	9	5	3	1		Fell	Require handgrips that are permanent.
A-Frame Crossbar	4			4		. Protruding bolts . Hand caught at joint of apex . Falling onto other equipment	Change design and construction to: . eliminate exposed bolts . insure sturdiness of swing set through anchorage and strong connections at joints . eliminate or provide alternative to crossbar
Frame	4	1	3			Swing set leaned forward or fell over	Require anchorage for swing set. Require plastic caps on exposed ends that adhere.
Hinge Supporting	1		1			. Rough edge	Eliminate rough edges.
Slide	12	6	3	1	2	. Poncho caught on railing (strangulation) . Protruding bolt . No railing on side attached to A-Frame	Change in design and construction to: . eliminate verticle member of angular uprights extending upward beyond rail . eliminate exposed bolts . include a railing on side of slide attached to swing set.

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DISTRIBUTION OF 62 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH HOME PLAYGROUND EQUIPMENT (1201, 1241-1244)
BY PART OF EQUIPMENT INVOLVED AND PROBABLY CAUSATIVE FACTOR

Part of Home Playground Equipment Involved	No. of Accidents	Probable Causative Factor				Hazard Pattern	Possible Preventive Mechanical Measures Related to Development of Standard
		People-Related	Product-Related	People & Product-Related	Unknown		
Climbing Apparatus:							
Jungle Gyms	6	3		3		Stunting	. Address problem of custom designed home playground equipment (of loop and metal bars.)
						Falling, losing grip	. Assure that diameter measurements of bars are sufficient for maximum grip.
Monkey Bars							. Require slip resistant surfacing of bars to prevent feet from slipping and hands from losing grip.
Merry-Go-Round	1			1		Tripped over base	. Limit degree of base extension.
Seesaw	3		1	1	1	Foot slipped from foot bar	. Require wider and texturized foot bars . Determine minimum distance between foot bars and ground to prevent pinning of foot.
Miscellaneous							
Rope Swing	1			1		Fell	. None
Homemade Bucket Swing	1	1				Struck fence	. None
Sandbox	1	1				Fell on victim	. None
Horizontal Plastic slide (stomach sliding-ground level)	1			1		Head snapped back after landing on stomach	. Determine classification

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Bureau of Epidemiology

APPENDIX "C"

SUMMARIZATION OF 83 IN-DEPTH INVESTIGATIONS OF PRODUCT RELATED INJURIES: PUBLIC PLAYGROUND EQUIPMENT (1201, 1241-1244)

April 1975

U.S. CONSUMER PRODUCT SAFETY COMMISSION

Bureau of Epidemiology

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDES - SIDE							
PATTERN:	Fell Over Side							
A11628	3/24/73	23 mo.	M	Leaned over on side	While sliding down to mother, leaned over and fell off side 6 feet to ground, landing on concrete under slide. Occurred at apartment playground.	Contusions-lacerations/face	Treated & Released	Slide
A11613	2/6/73	7	F	Went down with knees tucked under chin	Playing follow-the-leader on slide, went down with knees tucked under chin and feet flat on slide. One shoe stopped on either non-slippery surface or edge of slide and she went over edge. May have been injured on side of slide as fell off or when she landed on safety rubber padding around slide. Occurred at school playground.	Fracture/nose	T & R	Slide
A04846	3/23/73	7	F	Walking down slide	While walking down slide, fell off slide to ground at apartment complex.	Fracture/both wrists	T & R	Slide
A02014	9/25/73	5	F	Undetermined	While going down the slide in a housing project play area victim fell off the side. She doesn't recall how she did this. She fell 11 feet to the pavement. Described by mother as having "lots of accidents."	Fracture/ skull	Treated & Admitted (1 D)	Slide American
A13140	2/26/73	7	F	Ran down in crouching position	Victim, in hurry to join friends, ran down slide in crouching position grasping each side of slide with hands. Victim lost balance and fell off side of slide 5 feet to ground, striking head on cement base of a support pole. Severity may be complicated by possible epilepsy. Occurred on school playground.	Contusion/left parietal region	T & A (2 D)	Slide Mitchell Mfg.
PATTERN:	Knocked Off Side							
A07773	10/31/73	4	F	Followed immediately by playmate	Victim was bumped by a child coming down the slide behind her and knocked over the side. Victim fell 2 feet to the ground. Occurred at school playground.	Fracture/left upper arm	T & A (8 D)	Slide Bethlehem Steel

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDES - SIDE (cont.)							
PATTERN:	Knocked Off Side (cont.)							
A21211	4/15/73	8	F	Followed immediately by playmate	Victim was going down slide at ballfield. When halfway down, another child started down slide and struck her from behind, knocking her off 15 inches to the ground, landing on her shoulder on a stone.	Laceration/ fracture - left upper arm	T & R	Slide
A01807	4/8/73	7	F	Followed immediately by playmate	Victim came down very fast slide in public park. Her 10-year-old brother followed and struck her at bottom of slide, knocking her off onto hard packed dirt.	Fracture/ lower right leg	T & A (1 D)	Slide "Gametime" Vanco
	SLIDES - LADDER							
PATTERN:	Fell Over Side							
A06461	11/18/73	6	M	Going up ladder side by side with playmate	Victim and friend were walking up spiral slide in playground side by side, each holding on to a side edge. At approximately 9 feet, the victim either lost his balance or was accidentally bumped over the side.	Concussion/head Fracture/collar-bone	T & A (1 D)	Slide Miracle Equip. Co.
A13145	4/4/73	4	M	Climbed around others on ladder	Victim was playing with two other children who were forming a train to slide down. He tried to climb around the others in order to be first in train and fell over side to thick sand on surface of apartment playground. Victim has history of hyperactivity.	Fracture/ right clavicle	T & R	Slide Recreation Equip. Co.
PATTERN:	Fell Off Backwards							
A01879	6/10/73	2	M	Climbing ladder	Victim fell backwards off slide ladder and struck head on hard packed, pebbly dirt or on concrete at base of support.	Fracture/skull; Concussion/brain	T & A (10 D)	Slide American H-34
A17855	12/1/73	4	M	Climbing ladder	While climbing the ladder of a spiral slide in a city playground, victim fell backwards about 4 feet to the asphalt surface. Victim had missed his usual afternoon nap.	Contusion/head	T & R	Slide Gametime, Inc.

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDES - LADDER (cont.)							
PATTERN:	Fell Off Backwards (cont.)							
A13163	5/13/72	3	M	Slipped near top of ladder	In playground under father's supervision, victim slipped near top of ladder and started to fall down steps. He was caught by father near the bottom.	Contusions/ both legs; abrasion/cheek	Unknown	Slide Giant
A05287	1/21/74	12	F	Fighting with another to get down slide	On a public playground slide, victim and one or more playmates were wrestling on the platform to try to slide first. She either was pushed or fell from slide. In falling her thigh contacted a protruding bolt approximately 1 foot from top of slide.	Laceration/ thigh (16 stitches)	T & R	Slide Gametime
A20075	10/30/73	4	F	Undetermined	Victim fell from the slide platform six feet to concrete of playground.	Concussion/ brain	T & A (1 D)	Slide
A05345	2/28/74	3	M	Playmate fell on top of victim	On platform of playground slide, victim was pushed from behind by playmate and fell 6 feet. Playmate, in turn, was pushed and fell on top of victim. Muddy shoes may have affected victim's traction on platform.	Fracture/ Femur	T & A (15 D)	Porter Playground Slide
A06488	12/1/73	3	F	Undetermined	Victim was at a school playground, participating in a church outing. It is suspected that she fell from the top of the slide, but as there were no adult witnesses, sequence is unknown.	Fracture/ skull	T & A (5 D)	Slide
	SLIDES - MISCELLANEOUS							
PATTERN:	Undetermined							
113120Z	11/1/73	5	M	Undetermined	Involved in slide accident on playground.	Broken leg	T & R	Slide
PATTERN:	Struck Lip on End of Slide							
A02748	11/10/73	2	F	Going down feet first on stomach	In playground, victim went down slide feet first on stomach. At the bottom she struck her lip on the slide edge.	Laceration/ mouth & chin (infected)	T & R	Slide

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SLIDES - MISCELLANEOUS (cont.)								
PATTERN: Struck Metal Rim								
A21072	1/18/73	6	M	Tripped near slide	Victim tripped over "own two feet" wearing sneakers on dry, smooth macadam playground. Struck head on metal rim of sliding board which was approximately 5 feet high.	Deep laceration above right eye (13 stitches)	T & R	Slide
PATTERN: Fell Off Slide								
A13151	3/20/73	7	M	Struck seesaw support	Victim fell off slide at height of 4 to 5 feet and struck teeter-totter support in school playground. No witnesses. Victim was alone on slide.	Contusions/nose	T & R	Slide American
PATTERN: Struck Step								
A44966	8/19/73	3	M	Slipped from ladder	While climbing the steps one at a time, victim's foot slipped from ladder rung. He was using support railings. He did not fall, but he struck the stairs with forehead. Slide was in public park.	Laceration/ forehead	T & R	Metal slide
PATTERN: Slid Down and Tripped Over Board								
A05096	5/20/73	6	M	Board placed across slide	A group of boys in apartment complex placed board across slide 3 feet from ground. Victim was to slide down and jump over board. He tripped over the wooden board in the process and fell to the ground.	Fracture/ forearm	T & R	Slide
PATTERN: Awkward Landing								
A20091	11/14/73	8	F	Going off end	After sliding off edge of school playground slide, victim landed with her right leg under her buttocks on a hard gravel surface.	Fracture/ right ankle	T & R	Slide Recreation Equipment Corp.

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	SLIDES - MISCELLANEOUS (cont.)							
PATTERN:	Struck Friend							
A24331	6/13/73	9	M	Proceeded down immediately after playmate	Victim proceeded down slide immediately after playmate. He struck his friend and fell over the top of the boy.	Fracture/left forearm	T & R	Slide American
	CLIMBING APPARATUS (MONKEY BARS)							
PATTERN:	Lost Grip							
A01812	4/2/73	4	M	Hanging from bars	Victim was hanging from the bars during pre-school recess. He lost his grip and fell 18 inches. He dropped in an upright position to hard packed sand surface.	Fracture/right femur	T & A (5 D)	Monkey Bars Sears
A21112	4/17/73	9	F	Hanging from bars	As playmates called to victim using monkey bars in school playground, she lost her grip and fell to dirt and gravel surface 8'-10' below top of bar.	Dislocation/ left elbow	T & R	Monkey Bars
A01827	5/1/73	9	F	Swinging from bar to bar	Victim was swinging from bar to bar when she fell. Extending her arms to break her fall, she fractured her wrist on the hard packed dirt surface. Occurred in park.	Laceration/ forehead; Fracture/ right wrist	T & R (1 D)	Monkey Bars Gametime
A21116	4/29/73	7	F	Swinging from bar to bar	Victim born with defects, missing 2 fingers of right hand and partially missing 2 fingers from left. She was also overly tired. While swinging from bar to bar on the school playground, she lost her grip and fell to "hard ground."	Fracture/ right arm	T & R	Monkey Bars
A06469	11/15/73	6	F	Swinging from bar to bar	Victim was attempting to hand walk on bars when she lost her grip and fell to the sandy surface underneath the bars. Occurred at school. She told different people different stories.	Fracture/lower left arm	T & A (1 D)	Monkey Bars

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
CLIMBING APPARATUS (MONKEY BARS)(cont.)								
PATTERN: Lost Grip (cont.)								
A20015	9/14/73	10	F	Swinging from bar to bar	Victim lost grip on horizontal bar section and struck the back of her head on the asphalt directly under the bars in a city park.	Fractured skull/ hematoma	Expired (3 D)	Monkey Bars Gametime, Inc.
A02011	9/17/73	6	M	Swinging from bar to bar	Victim was swinging from rung to rung. His hand slipped and he fell landing in the dirt with his right hand down at the playground.	Fracture/right radius and ulna	T & A (3 D)	Monkey Bars
A02026	10/2/73	7	M	Swinging from bar to bar	Victim was swinging from rung to rung, in a hurry because he was being called in from school recess. He lost his grip and fell to a safety mat below. His arm broke either from the force of the fall or from striking a nearby metal pole.	Fracture/left humerus	T & A (1 D)	Monkey Bars "Muscle Man" Gametime, Inc.
A05068	7/31/73	8	F	Playing tag on bars	Playing tag on bars in public playground, victim lost grip while attempting to avoid tag and fell 3 feet to ground.	Contusion/wrist	T & R	Monkey Bars
PATTERN: Fell								
A12351	1/11/74	9	F	Bumped by second child	While on the apparatus during school recess, victim was bumped by another child and fell 9 feet to the ground, fell head first and stuck her arm out to break her fall.	Fracture/right elbow	T & A (3 D)	Monkey Bars
A12378	2/5/74	5	F	Undetermined	During recess, victim somehow fell off monkey bars. There were no adult witnesses. The ground was unpaved.	Fracture/right elbow	T & R	Monkey Bars
A05019	10/19/73	10	F	Undetermined	Victim cannot remember how she fell to the ground at the school playground.	Contusion-internal head, chest, groin	T & R	Spidertype Monkey Bars

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
CLIMBING APPARATUS (MONKEY BARS)(cont.)								
PATTERN: Lost Footing								
A21674	11/12/73	2	M	Climbing down bars	At an apartment complex playground, victim was climbing down monkey bars when his tennis shoes slipped from a rung. His head was battered between rungs as he fell. He wears corrective shoes and has a coordination problem.	Laceration, contusion/head, face, leg	T & R	Monkey Bars
A02027	10/1/73	8	F	Walking on top of bars	Victim was walking along top of horizontal bars not holding on to anything. She missed her footing and fell on her side on the bars of a school playground.	Nephrectomy/ kidney	T & A (19 D)	Monkey Bars
A02720	10/1/73	5	M	Climbing onto bars	Victim climbed monkey bars of city park, lost his balance, slipped and fell to the sand. Victim was wearing tennis shoes.	Fracture/skull	T & R	Monkey Bars
CLIMBING APPARATUS (JUNGLE GYM)								
PATTERN: Slipped								
A24075	5/26/73	7	M	Slipped	Victim was alone and couldn't remember how his lip was cut. He was climbing from bar to bar in a playground when his foot slipped.	Laceration/ lower lip	T & R	Jungle Gym
A21713	11/20/73	5	M	Slipped	On jungle gym situated on a rubber mat in a shopping center, victim was roughhousing with other children. He was hurriedly climbing down the ladder, back to the apparatus, when his foot slipped and he struck his head on the ladder.	Contusion/back of head	T & R	Jungle Gym
A21135	3/1/73	9	M	Slipped	Victim was hurriedly climbing ladder of gym in school yard at recess. He lost his footing, then his grip, falling to the macadam surfaced ground.	Contusion/ head	T & R	Jungle Gym
PATTERN: Lost Grip								
A23038	9/4/73	8	F	Swinging from rung to rung	While hand walking across set, victim lost grip and fell to the ground with arm outstretched to stop fall. Surface of school playground was hard-packed dirt.	Sprain/right wrist	T & R	Jungle Gym "Castle Walk American Playground Co.

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	CLIMBING APPARATUS (JUNGLE GYM)(cont.)							
PATTERN: Fell Backward								
A01816	4/14/73	13	F	Lost footing on slippery bars	On a rainy day in an apartment complex playground, victim lost her footing on the slippery bars and fell backward, landing on her shoulder on the hard packed and rocky ground.	Fracture/ left humerus	T & A (3 D)	Jungle Gym
PATTERN: Struck Head on Bars								
A05249	1/31/74	12	M	Jumping from top rung	Playing in park, victim was standing on top rung of apparatus and decided to jump down one of the shafts in the set. He misjudged the distance and struck his head on one of the metal bars. He was wearing eyepatch at the time.	Laceration/head	T & R	Jungle Gym
PATTERN: Struck Head on Ground								
A00569	11/20/73	8	M	Rotating bar on stomach	During recess, victim was on one of the lowest horizontal bars 22 inches above the cement surface. Victim leaned on bar with stomach and held on. He swung his head down and lifted his feet intending to rotate around the bar. He misjudged the distance to the cement and struck his head on it.	Laceration/ forehead	T & R	Jungle Gym
PATTERN: Loss of Grip								
A17819	8/6/73	12	M	Jumping from bar to bar	Little is known. Victim tried to duplicate an older boy's stunt. He was standing on one of the bars or the steps and tried to jump to another bar. He missed his grip and fell to the ground in the city park. (Playground set was custom designed and constructed of wooden logs & metal bars.)	Concussion/ fracture/ right clavicle	T & A (7 D)	Custom designed Jungle Gym Giant Outdoor Muscle Man Gametime

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	CLIMBING APPARATUS - JUNGLE GYM (cont.)							
PATTERN:	Missed His Grip and Fell							
A01871	6/4/73	8	M	Jumping from log to metal bar	On a free form climbing structure on school grounds, victim tried to jump from a wooden horizontal log to a metal crossbar approximately 6 feet away. He missed his grip and fell on his back with his arm under him on very hard packed dirt mixed with stones and other debris. (Playground set was custom designed and constructed of wooden logs and metal bars.)	Fracture/right elbow	T & A (1 D)	Custom designed Jungle Gym Big Toys
PATTERN:	Fell From Cross Bar							
A11677	10/15/73	4	M	Undetermined	Father was with victim but didn't see him fall from 6 foot high crossbar to the astroturf surface at day care center. (Playground set was custom designed and constructed of wooden logs and metal bars.)	Fracture/skull	T & A (5 D)	Custom designed jungle gym Child Life
10103046	10/5/73	10	M	Fell	Victim fell from playground bars and fell 7 feet striking head on hard playground surface. Asphalt surface.	Head injuries	Expired	Playground bars
	CHINNING BAR							
PATTERN:	Lost Grip							
A18358	12/13/73	7	F	Swinging on bar	At school recess, victim was swinging on horizontal bar when she lost her grip. Momentum carried her past a rubber safety pad underneath the bar. She landed on blacktop on her knees and then the heels of her hands.	Fracture/lower arm	T & A	horizontal bar
A04044	9/20/73	10	F	Hanging on bar	Victim was hanging on the bar in the school playground when she lost her grip. Loose gravel on the blacktop surface then caused her to lose her footing.	Laceration/ chin	T & R	Horizontal bar

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	CHINNING BAR (cont.)							
PATTERN:	Lost Grip (cont,)							
A13158	Unknown	9	F	Spinning on bar	Victim had been spinning on bar in school playground by having one leg hooked over bar and the other dropping straight down behind the bar. Grasping the bar with both hands, she would spin backward under the bar and return to a seated position. In one, attempted to spin backward under bar too quickly and lost her grip, falling to blacktop.	Fracture/skull	Treated & Transferred (5 D)	Horizontal bar
A13160	4/6/73	9	F	Stunting	Victim doing a stunt on the bar in the school playground involving hanging by a leg, then grasping the bar and twisting up into a sitting position on the bar. She lost her grip from the 68 inch high bar, falling to gravel surface.	Abrasion/ forehead	T & R	Horizontal bar
A18377	1/22/74	11	F	Maneuvering a "flip off"	Victim was practicing "flip off" (hanging by knees and landing on feet) in unsupervised school playground after school. She had been asked repeatedly to leave. She attempted the stunt once more and couldn't land on her feet and fell into a sawdust surface.	Fracture/ lower left arm	T & R	Horizontal bar
	SWING SET - SWING							
PATTERN:	Lost Grip							
A00357	11/13/73	9	F	Swinging	At school playground, victim swung up as high as she could and lost her grip. She lost her balance and fell on the dirt ground.	Fracture/ left arm	T & R	Swing
A12366	1/27/74	6	F	Swinging	Victim was standing on swing seat, going higher. Her hand slipped from the chain and then her feet slipped off. She fell to the ground of the city park.	Fracture/ lower right arm	T & R	Swings

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SWING SET - SWING (cont.)								
PATTERN: Lost Grip (cont.)								
A04843	3/11/73	2	M	Sister was pushing swing	Older sister was pushing victim on park swing. As the swing went higher, victim became frightened and released his grip, falling to the ground.	Contusion/ mouth	T & R	Swing set
PATTERN: Struck by Swing								
A11687	11/9/73	11	M	Playing near swing	During recess, victim was playing Nerf ball. He was trying to catch the ball in the area of the swings when he was struck by the foot of a child swinging and then by the swing seat itself.	Laceration/ forehead, cheek	T & R	Swings American
A22521	3/7/73	3	M	Pushing swing	Victim and brother were standing on either side of a playground swing and pushing it back and forth. Victim failed to catch the swing and it struck him on the forehead.	Laceration/ forehead	T & R	Wooden swing seat
A05129	10/13/73	11	F	Pushing swing of friend	At playground, victim was standing behind swing pushing friend. She was distracted by someone yelling and didn't see swing coming back toward her. The seat struck her in the forehead.	Laceration/ forehead	T & R	Swing set American
A06417	10/21/73	2	F	Being pushed in swing	Victim was being pushed on swing by paraplegic father who relies on crutches for support. He fell over and couldn't catch her as she came back. She fell out of the swing face first. Although "homemade," the wooden swing set was very elaborate and appeared very sturdy. It is in a city park.	Laceration/ lip	T & R	Custom designed playground swings

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	PENDULUM SEESAW - GLIDER							
PATTERN:	Downward Pressure of Moving Glider							
A15029	3/26/73	4	M	Stuck head between two support bars	As the glider was in backswing, victim put head and shoulders beneath a hand support pipe. As the swing started forward, the pipe then put downward pressure on victim's shoulders and upper trunk. Occurred on nursery school playground.	Strain-sprain/ lower back	T & R	Pendelum seesaw (Glider) Gametime, Inc.
	RINGS							
PATTERN:	Lost Grip							
A02028	10/3/73	9	M	Swinging sideways on rings	Victim was swinging sideways on rings on school playground. He lost grip and his momentum carried him over 4 foot safety pad under the rings and on to asphalt.	Concussion/ head	T & A (1 D)	Swinging rings Patterson Williams
	TRAPEZE BAR							
PATTERN:	Fell Off							
A13184	7/11/73	5	F	Sitting on trapeze bar	Victim was sitting on trapeze bar of swing in restaurant play area. She fell off, striking the ground.	Laceration/ lower lip	T & R	Swing set Turco Mfg. Co.
	MERRY-GO-ROUND							
PATTERN:	Flew Off Merry-Go-Round							
A24568	8/20/73	4	F	Lost grip on bar	On a playground, victim lost her grip as the merry-go-round gathered speed and "flew" off, landing on hard packed dirt mixed with pebbles.	Laceration/ forehead	T & R	Merry-go-round "Pull Away Gametime"
PATTERN:	Fingers Caught in Hand Grip							
A13170	6/10/73	7	F	Attempting to stop	Victim tried to stop the rotating apparatus in a municipal park by grabbing a hand grip on the dome whirl. She could not and her fingers were caught in the grip for a second, dislocating them.	Dislocation/ fingers	T & R	Merry-go-round Dome Whirl Miracle Equip. Co.

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	MERRY-GO-ROUND							
PATTERN:	Amputation of Finger							
A06406	2/21/73	9	M	Undetermined	A push-pull apparatus providing power for the merry-go-round is connected to a rod that revolves across the open end of a pipe that supports the structure. These rods revolve across the pipe's open end and could amputate a finger stuck through the open pipe. This is possibly the cause of the victim's amputation at the day care center.	Amputation	T & R	Merry-go-round "Pull-a-way" Gametime, Inc.
PATTERN:	Lying Beneath Merry-Go-Round							
A07200	1/31/73	6	M	Stuck hand up through center	Victim stuck his hand up through the middle of the merry-go-round while lying under it at school playground.	Fracture/upper right arm	T & A	Merry-go-round Speedway Mfg. Co.
PATTERN:	Lost Balance							
A21946	7/18/73	7	M	Sitting on sloping bar	Victim was riding merry-go-round at neighborhood playground sitting on a bar sloping downward toward the center. He lost his balance, falling backward and striking his head on a bar at right angles to the one he was sitting on.	Laceration/scalp	T & R	Merry-go-round
	SEESAW							
PATTERN:	Fell Off							
A30720	1/16/74	8	F	Going up and down rapidly	At school playground, victim and friend were going up and down quite rapidly on seesaw. Victim lost balance while at height of movement and fell on hard clay ground.	Torn ligament/ elbow	T & R	Seesaw, Miracle Equip. co.
A07725	8/31/73	5	M	Couldn't get off high end	Victim was in air on seesaw and playmate wouldn't let him off. He fell off. Occurred at school playground.	Fracture/lower arm	T & A (3 D)	Seesaw
A00298	9/20/73	7	F	Undetermined	At school playground, victim was either pushed off or fell from seesaw 4 feet to macadam surface.	Contusion/ abrasion-face	T & R	Seesaw, American

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
SEESAW (cont.)								
PATTERN: Fell Off (cont.)								
A15178	9/23/73	3	F	Attempting to mount	Victim was attempting to mount teeter-totter in city park with another child jumping up and down at the other end. She fell, striking her chin against the foot peg.	Laceration/ chin	T & R	Seesaw Gametime, Inc.
PATTERN: Pulled Forward On Grip								
A04943	4/1/73	13	F	End struck ground	When victim's end of seesaw struck the ground, she fell backward and attempted to right herself by pulling forward on hand grip. The force fractured her ankle. Occurred in state park playground.	Fracture/left forearm	T & R	Playground seesaw
PATTERN: Undetermined								
A21004	4/15/73	6	M	Broken torsion spring	Public playground seesaw had broken torsion spring on side on which victim was riding, causing the seesaw to come too close to the ground. Victim may have caught foot underneath, but there were no adult witnesses.	Sprain/left ankle	T & R	Seesaw
MISCELLANEOUS - ROPE SWING								
PATTERN: Rope Broke								
A01890	7/19/73	14	M	Five boys on rope	Five boys were playing on an unauthorized rope swing in a public park. As they swung out over the steep incline, the rope broke at the point where it was tied to a tree limb, dropping the boys to a hard packed dirt surface. Three of the boys suffered injuries. The victim suffered a fractured spine and severed spinal cord; the other two boys breaking a wrist and a collar bone.	Fracture/spine and severed spinal cord	T & A (90 D)	Rope swing

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	MISCELLANEOUS - TIRE SWING							
PATTERN:	Struck in Back of Neck							
A44557	7/28/73	3	M	Two swings collided	At city playground, victim and friends were in tire swings that can move in any direction. Two of the swings collided one striking the victim in the back of the neck. He was able to remain on the swing until it stopped.	Strain/neck	T & R	Tire swing Play Timber Co.
	MISCELLANEOUS - CONCRETE MOOSE							
PATTERN:	Fell Against Side							
A44579	7/30/73	7	M	Dismounting concrete animal	Victim was dismounting concrete moose by raising one leg over the back of the animal when his other foot slipped and he fell against the side of the animal. The animal in the city park was in disrepair, having jagged broken surfaces.	Laceration/ head	T & R	Concrete moose- Creative Parks & Playgrounds, Inc.
	MISCELLANEOUS - TUB MOBILE							
PATTERN:	Struck Head on Rough Edge							
A00136	7/13/73	4	M	Struck by second Tub-mobile	Victim was standing beside "tub-mobile" in a day care center playground when he was struck by a playmate in another "tub-mobile." He fell forward and struck his head on the rough metal edge of the apparatus.	Laceration/ face	T & R	"Tub-Mobile" Child Craft
	MISCELLANEOUS - TOY HORSE							
PATTERN:	Struck by Hand Grip							
A22020	4/25/73	5	M	Pulling on foot rest	Horse sits on large coil. Victim was standing beside the toy pulling on the foot rest and causing the horse to rock sideways. This sideway motion caused the metal hand grip on the horse's head to strike the victim in the forehead. Occurred in hospital playground.	Abrasion/upper left forehead	T & R	Playground equipment/ toy horse

CASE NO.	DATE	AGE	SEX	PRECIPITATING EVENT/ACTIVITY	DESCRIPTION	RESULT	DISPOSITION	PRODUCT/MAKE COMPOSITION
	MISCELLANEOUS - WOODEN SANDBOX							
PATTERN:	Sandbox Fell On Victim							
A06472	11/19/73	5	M	Undetermined	Somehow, at the school playground, sandbox fell on the victim.	Fracture/upper left leg	T & A (28+ D)	Homemade wooden sandbox

Abbreviations Used in This Analysis

M - Male
F - Female
T & R - Treated and released from emergency room
T & A - Treated and admitted for hospitalization
T & Trans - Treated and transferred for further treatment

(# D) - Number of days hospitalized. If no (# D) is given it can be assumed the number of days was not reported under "Treated and Admitted for Hospitalization."

Source:

In-depth investigations are conducted by the U.S. Consumer Product Safety Commission's (CPSC) headquarters and field staff and by private contractors throughout the country. Information presented in this summary pertains only to the cases cited. The data are not statistically representative of all injuries associated with this product. All in-depth investigation reports are on file in the National Injury Information Clearinghouse of the U.S. Consumer Product Safety Commission.

APPENDIX "D"

DISTRIBUTION OF 83 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH PUBLIC PLAYGROUND EQUIPMENT (1201, 1241-1244)

BY PART OF EQUIPMENT INVOLVED AND PROBABLE CAUSATIVE FACTOR.

April 1975

U. S. CONSUMER PRODUCT SAFETY COMMISSION

Bureau of Epidemiology

DISTRIBUTION OF 83 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH PUBLIC PLAYGROUND EQUIPMENT (1201, 1241-1244)
BY PART OF EQUIPMENT INVOLVED AND PROBABLE CAUSATIVE FACTOR

Part of Public Playground Equipment Involved	No. of Accidents	Probable Causative Factor				Hazard Pattern	Possible Preventive Mechanical Measures Related to Development of Standard
		People-Related	Product-Related	People & Product-Related	Unknown		
Total	83	14	7	53	9		
Swing Set:							
Swing	6	3		3		Loss of grip	*Assure that chain is sufficient for maximum grip.
Rings	1	1				Loss of grip	*Require slip resistant surfacing A-bar to prevent loss of grip.
Glider	1			1		Entrapment of head between support bars	. Ensure spread between supporting bars sufficient enough to prevent heads from becoming entrapped.
Trapeze Bar	1	1				Sitting on bar; fell	. Require slip resistant surfacing on bar to prevent loss of grip.
Custom Designed Swing Set	1	1				Fell	None
Slides:							
Slide and platform	12		None (Only in regard to playground surface)	12		Fell over side (one DOA)	. Address the problem of height of slide, height of sides of slide, and ladder distance from the ground. . Address the problem of the type of surfacing used on public playgrounds. . Require slip resistent surface on ladder rungs.
Ladder	5			5		Slipped; fell	. Assure adequate vertical measurement between rungs of ladder
Miscellaneous	8			4	4	Fell	None
Climbing Apparatus:							
Monkey Bars	15			13	2	Fell	. Address the problem of the type of surfacing used on public playgrounds. . Assure that diameter measurements of bars are sufficient for maximum grip. Require slip resistant surfacing on bars to prevent slipping and loss of grip.
Jungle Gym	8			8		Slipped, loss of grip, fell	
Horizontal Bar (Chinning)	5			5		Stunting; fell	
Custom Designed	3	2			1	Stunting; fell	None

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DISTRIBUTION OF 83 IN-DEPTH INVESTIGATIONS OF ACCIDENTS ASSOCIATED WITH PUBLIC PLAYGROUND EQUIPMENT (1201, 1241-1244)
BY PART OF EQUIPMENT INVOLVED AND PROBABLE CAUSATIVE FACTOR

Part of Public Playground Equipment Involved	No. of Accidents	Probable Causative Factor				Hazard Pattern	Possible Preventive Mechanical Measures Related to Development of Standard
		People-Related	Product-Related	People & Product-Related	Unknown		
Merry-Go-Round	5	1	4			. Fingers caught in grip and stopping apparatus . Thrown off . Attempting to stop	. Eliminate all pivot points and crush points. Change in design and construction to: . limit speed of revolving merry-go-round . ensure handgrips that respond to the force of the revolving apparatus. . ensure that handbars on merry-go-round are designed to accommodate force of revolving apparatus and rider.
Seesaw	6	4	1		1	Broken torsion ring	Ensure integrity of design and construction.
Miscellaneous:							
Concrete Moose	1			1		. State of disrepair	None
Rope Swing	1		1			. Rope broke at point where tied to tree	None
Tire Swing	1		1			. Two swings collided	None
Wooden Sandbox	1				1	. Struck by hand grips while standing at side	None
Toy Horse	1			1			
Tubmobile	1	1				. Collided with second tubmobile	None

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APPENDIX "E"

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SUMMARIZATION OF 24 DEATH CERTIFICATES RELATED TO PLAYGROUND EQUIPMENT

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TOTAL 24

I. (1241) Swings 20

A. Fell from swing 8
1. Home 6
2. Public 2

B. Hangings 7
1. Home 6
2. Public 1

C. Struck by swing part 3
1. Home 1
2. Public 2

D. Miscellaneous 2
1. Home 1
2. Public 1

II. (1242) Slides 3

A. Fell from slide 2
1. Public 2

B. Hanging 1
1. Home 1

III. (1201) NOS (Merry-go-round) 1

A. Fell from merry-go-round 1
1. Public 1

SUMMARIZATION OF 24 DEATH CERTIFICATES RELATED TO PLAYGROUND EQUIPMENT

Product Code/Description	Age	Sex	Date	Cause of Death/Accident Sequence	Location of Accident
SWINGS					
PATTERN: Fell from Swing					
1241	1	M	6/16/74	Fell from swing--death caused by blunt force injury to head--cerebral edema.	Home
1241	2	F	12/1/73	Blunt injury to head--fell out of swing while playing. Delayed effect.	Home
1241	14	M	6/5/74	Fell from rope swing, hit rocks. Closed head injuries, with multiple cerebral lacerations.	Home
1241	1	M	12/15/73	Subdural hematoma; fell from a swing on face.	Home
1241	6	F	7/24/74	Fell out of swing.	Home
1241	7	F	3/30/74	Fractured skull; fell from swing onto concrete.	Playground
1241	6	M	9/14/74	Probable fractured neck; fell from swing.	Children's home
1241	16	M	1/20/74	Respiratory arrest, brain damage; fell out of swing.	
PATTERN: Hanged					
1241	3 mo.	F	7/31/73	Anoxia due to strangulation. Caught neck in swing set.	Home
1241	9	M	8/21/73	Asphyxiation; hanging--accidentally hanged by wire while playing on top of a swing from which he apparently fell.	Home
1241	3	M	9/4/73	Child choked when shirt caught on swing set as he fell. Asphyxia by hanging.	Home
1241	9	M	9/12/73	Strangulation--was playing with a rope swing and accidentally got the rope around his neck.	Home
1241	8	M	7/3/74	Cardiac arrest--strangulation. Hung himself on swing set while playing.	Home
1241	4	M	3/3/74	Asphyxia--compressive ligature about neck. Victim became entangled in the chains of a swing set and strangled.	School playground
1241	12	M	4/24/74	Cerebral hypoxia with cardiac arrest--asphyxia by hanging. Found hanging from swing.	

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SUMMARIZATION OF 24 DEATH CERTIFICATES RELATED TO PLAYGROUND EQUIPMENT

Product Code/Description	Age	Sex	Date	Cause of Death/Accident Sequence	Location of Accident
PATTERN: Struck by Swing Set Part					
1241	8	F	8/10/74	Struck on head by swing support bar. Crush injuries to head; blunt face trauma.	Home
1241	6	F	10/12/73	Swing fell on patient at school; head trauma	School
1241	2	F	7/25/73	Hit in head by a swing; bilateral lower lobe pneumonitis; cerebral concussion and contusion.	St. Louis Park
PATTERN: Swing Set Collapsed					
1241	8	M	4/21/74	Massive cerebral injury with skull fracture. Swing set collapsed.	Neighbor's yard
PATTERN: Fell into Swing					
1241	63	M	4/17/74	Walked into backyard and fell into swing. Aspiration, pneumonia brain damage, atrophy and subdural hematoma; coma 4 months.	Rest home
SLIDES					
PATTERN: Fell from Slide					
1242	9	M	1/24/74	Fell off sliding board. Extensive intracranial hemorrhage; head injury.	School playground
1242	7	F	6/24/73	Fell from slide--cardiac respiratory failure--acute subdural hematoma with right temporoparietal skull fracture.	Park
1242	8	F	10/6/74	Cardio respiratory arrest--suffocation hanging--child playing on sliding board hung herself.	Home
MERRY-GO-ROUND					
PATTERN: Fell from Merry-Go-Round					
1201	5	M	8/22/73	Received a blow to his abdomen when he fell from a merry-go-round at school.	School

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